

We Claim:

- 1 1. Circuit arrangement with semiconductor elements arranged in chips  
2 comprising:
  - 3 - at least one metallic body for electrical contacting of the semiconductor elements  
4 and for dissipation of the heat generated in the semiconductor elements, whereby  
5 the metallic body or bodies are designed in such a way that the metallic body or  
6 bodies simultaneously serve as carriers for the semiconductor elements, and the  
7 chips are fastened to the metallic body or bodies, and wherein
  - 8 - the semiconductor elements comprise first semiconductor elements which are  
9 switched in parallel,
  - 10 - the body or bodies include a first body to which the chips of the first  
11 semiconductor element are fastened,
  - 12 - at least a first metallic bus body is provided as a terminal for a control module,
  - 13 - the control connections of the first semiconductor elements are electrically  
14 connected to the first bus body with the aid of bond wires,
  - 15 - the semiconductor elements include second semiconductor elements switched  
16 in parallel,
  - 17 - the body or bodies include a second body to which the chips of the second  
18 semiconductor element are fastened and which is arranged next to the first body,
  - 19 - a second metallic bus body is provided as a terminal for the control module, and
  - 20 - the control terminals of the second semiconductor elements are connected to the  
21 second bus body with the aid of bond wires.
- 1 2. Circuit arrangement in accordance with Claim 1, wherein
  - 2 - the semiconductor elements are electrically connected to the body or bodies so that  
3 the chips of the semiconductor elements are fastened directly without a chip  
4 housing to the body or bodies.

- 1     3.     Circuit arrangement in accordance with Claim 1, wherein  
2     - the chips of the semiconductor elements are connected to the associated body in  
3     each case by conductive adhesive or by solder.
- 1     4.     Circuit arrangement in accordance with Claim 1, wherein  
2     - to dissipate the heat generated in the semiconductor elements the body or bodies is  
3     or are arranged on a cooling device electrically isolated from the body or bodies.
- 1     5.     Circuit arrangement in accordance with Claim 1, wherein  
2     - a third metallic bus body is provided as a ground connection, and  
3     - the terminals of the semiconductor elements are connected to the third bus body  
4     with the aid of bond wires.
- 1     6.     Circuit arrangement in accordance with Claim 1, wherein  
2     - the body or bodies and/or the first bus body and/or the second bus body and/or the  
3     third bus body are substantially made of copper.

- 1     7.     Circuit arrangement comprising:
- 2     - a plurality of semiconductor elements,
- 3     - at least one metallic body for electrical contacting of the semiconductor elements
- 4       and for dissipation of the heat generated in the semiconductor elements, whereby
- 5       the metallic body or bodies are designed in such a way that the metallic body or
- 6       bodies simultaneously serve as carriers for the semiconductor elements, and the
- 7       semiconductor elements are fastened to the metallic body or bodies,
- 8     - first semiconductor elements of the semiconductor elements which are switched in
- 9       parallel,
- 10    - a first body of the at least one metallic body to which the first semiconductor
- 11      elements are fastened,
- 12    - at least a first metallic bus body as a terminal for a control module,
- 13    - control connections of the first semiconductor elements which are electrically
- 14      connected to the first bus body by means of bond wires,
- 15    - second semiconductor elements of the semiconductor elements which are switched
- 16      in parallel,
- 17    - a second body of the at least one metallic body to which the second semiconductor
- 18      elements are fastened and which is arranged next to the first body,
- 19    - a second metallic bus body as a terminal for the control module, and
- 20    - control terminals of the second semiconductor elements which are connected to the
- 21      second bus body by means of bond wires.
- 1     8.     Circuit arrangement in accordance with Claim 7, wherein
- 2     - the semiconductor elements are electrically connected to the body or bodies such
- 3       that the semiconductor elements are fastened directly without housing to the body
- 4       or bodies.
- 1     9.     Circuit arrangement in accordance with Claim 7, wherein
- 2     - the semiconductor elements are connected to the associated body in each case by
- 3       conductive adhesive or by solder.

- 1    10.    Circuit arrangement in accordance with Claim 7, wherein
- 2    -    to dissipate the heat generated in the semiconductor elements, the body or bodies is
- 3       or are arranged on a cooling device electrically isolated from the body or bodies.
  
- 1    11.    Circuit arrangement in accordance with Claim 7, wherein
- 2    -    a third metallic bus body is provided as a ground connection, and
- 3    -    at least a terminal of the semiconductor elements is connected to the third bus body
- 4       with the aid of a bond wire.
  
- 1    12.    Circuit arrangement in accordance with Claim 7, wherein
- 2    -    the body or bodies and/or the first bus body and/or the second bus body and/or the
- 3       third bus body are substantially made of copper.

- 1    13.    Method of manufacturing a circuit arrangement comprising the steps of:
- 2    - providing a plurality of semiconductor elements,
- 3    - providing a cooling body;
- 4    - arranging at least a first metallic body on said cooling body to which first
- 5    semiconductor elements of said semiconductor elements are fastened,
- 6    - arranging at least a first metallic bus body on said cooling body as a terminal for a
- 7    control module,
- 8    - coupling control connections of the first semiconductor elements to the first bus
- 9    body by means of bond wires,
- 10   - arranging at least a second metallic body next to the first body to which second
- 11   semiconductor elements of said semiconductor elements are fastened,
- 12   - arranging a second metallic bus body as a terminal for the control module, and
- 13   - connecting control terminals of the second semiconductor elements to the second
- 14   bus body by means of bond wires.
- 1    14.    The method as in claim 13, further comprising the step of providing an
- 2    insulating layer between said cooling body and said metallic bodys.
- 1    15.    The method as in claim 13, further comprising the step of connecting the
- 2    semiconductor elements electrically to the body or bodies such that the
- 3    semiconductor elements are fastened directly without housing to the body or
- 4    bodies.
- 1    16.    The method as in claim 13, further comprising the step of connecting the
- 2    semiconductor elements to the associated body in each case by conductive adhesive
- 3    or by solder.

- 1     17.     The method as in claim 13, further comprising the steps of:
- 2     -     arranging a third metallic bus body as a ground connection on top of one of said
- 3     metallic bodies, and
- 4     -     connecting at least a terminal of the semiconductor elements to the third bus body
- 5     with the aid of bond wires.